

JOURNAL

OF THE

WASHINGTON ACADEMY OF SCIENCES

Vol. 49

AUGUST-SEPTEMBER 1958

No. 8

BOTANY.—*Adventitious bud and stem relationship in apple.* HAIG DERMEN, Crops Research Division, U. S. Department of Agriculture, Beltsville, Md.

(Received May 12, 1959)

Under a title as of the present article some details relating to adventitious bud development on the stem of apple were reported at the 1956 meeting of the Botanical Society of America. The following note on this subject appeared in the mimeographed "Abstracts" assembled for the abstracts of the papers presented at the meetings of the General Section of the Botanical Society: "In early March of this year 10 one-year-old apple trees of the variety Maiden Blush were cut back to about 12", planted in 10" pots and disbudded to induce adventitious bud development on the stem. A number of buds developed endogenously on the stems adjacent to scars of cut-off buds as well as in internodal regions. Buds were examined by making serial tangential cuts under them. Under the normal buds, three leaf traces and a bud trace could be followed into the stem pith but *no* trace of any nature was observed in the stem behind the adventitiously induced buds. Adventitious buds which developed near normal bud scars had no connection with any leaf or bud trace. The results reported here verify and extend conclusions made previously with similar material."

General information on the subject here discussed appeared in earlier publications (Dermen, 1948, 1951a, 1955a). Some additional details with illustrative material are presented here. This article will also formalize the note quoted from the mimeographed abstract.

Fig. 1-A shows a 1-year-old tree of Maiden Blush apple disbudded to induce

development of adventitious buds on the stem. Round scars along the stem mark the nodal regions where normal buds were cut off. Arrows *a* and *b* point to two adventitious buds that developed several weeks after normal buds were excised. The same two buds are shown in the enlarged photograph in Fig. 1-B indicated by arrows. The same portion of the stem, shown in Fig. 1-C from side view in respect to the buds, shows the upper bud already grown into a shoot and the lower one barely grown through the bark.

Fig. 2 shows an adventitious bud (indicated by an arrow) from another tree of Maiden Blush lifted from the stem with a piece of bark attached and sectioned by the free-hand method with a razor blade. The bud was still inside the bark when lifted from the stem and the bark over the bud was barely cracked. In Fig. 2 the centrally located darkened region, appearing irregularly inside the bark, is where the bulk of the adventitious bud had developed. The curved portion at the upper side of the endogenous growth indicated by the arrow is the shoot apex of the bud. Sometimes from such endogenously proliferating growth more than one shoot emerged.

At the stage of adventitious growth shown in Fig. 2 no mark of any sort was detectable on the wood surface at the point of the adventitious bud growth when the bark was lifted; whereas behind all true nodal buds there were clearly visible marks of vascular tissue connection between leaf and bud at a node and the wood under the bark.